

CLAIMS

What is claimed is:

1. A method of managing a plurality of data communication connections having differing data communication rates, comprising:
 - A) assigning said data communication connections to a plurality of buckets that have a circular order;
 - B) establishing a bucket of said plurality of buckets as a current bucket and establishing another bucket as a fast bucket;
 - C) establishing a connection assigned to said current bucket as a current connection;
 - D) communicating data over said current connection;
 - E) in response to communicating data over said current connection, re-assigning said current connection to a different bucket of said plurality of buckets based upon where said current bucket resides in said circular order and a bandwidth estimation of said current connection;
 - F) repeating steps (C), (D) and (E) for each connection assigned to said current bucket;
 - G) establishing a next bucket as a new current bucket, wherein said next bucket follows said current bucket in said circular order;waiting until the earlier of (1) when any connection in the fast bucket is ready for communication or (2) when a pre-defined period of time elapses; and repeating step (F) and (G) for each bucket of said plurality of buckets.
2. The method recited in claim 1, further comprising always placing each newly established connection in the fast bucket until a pre-determined number of bytes have been communicated on the newly established connection.

1 3. The method recited in claim 1, further comprising:
 2 measuring time elapsed in processing connections in a bucket; and
 3 reducing a rate of establishing the connections when the measured time increases.

1 4. A computer-readable medium carrying one or more sequences of instructions for
 2 managing a plurality of data communication connections having differing data
 3 communication rates, wherein execution of the one or more sequences of instructions
 4 by one or more processors causes the one or more processors to perform the steps of:
 5 A) assigning said data communication connections to a plurality of buckets that have
 6 a circular order;
 7 B) establishing a bucket of said plurality of buckets as a current bucket and
 8 establishing another bucket as a fast bucket;
 9 C) establishing a connection assigned to said current bucket as a current connection;
 10 D) communicating data over said current connection;
 11 E) in response to communicating data over said current connection, re-assigning said
 12 current connection to a different bucket of said plurality of buckets based upon
 13 where said current bucket resides in said circular order and a bandwidth
 14 estimation of said current connection;
 15 F) repeating steps (C), (D) and (E) for each connection assigned to said current
 16 bucket;
 17 G) establishing a next bucket as a new current bucket, wherein said next bucket
 18 follows said current bucket in said circular order;
 19 waiting until the earlier of (1) when any connection in the fast bucket is ready for
 20 communication or (2) when a pre-defined period of time elapses; and
 21 H) repeating step (F) and (G) for each bucket of said plurality of buckets.

1 5. The computer readable media recited in claim 4, wherein the steps further comprise
 2 always placing each newly established connection in the fast bucket until a pre-
 3 determined number of bytes have been communicated on the newly established
 4 connection.

1 6. The computer readable media recited in claim 4, wherein the steps further comprise:
 2 measuring time elapsed in processing connections in a bucket; and
 3 reducing a rate of establishing the connections when the measured time increases.

1 7. A computer system, comprising:
 2 a processor; and
 3 a memory coupled to said processor, said memory comprising one or more sequences
 4 of instructions for managing a plurality of data communication connections
 5 having differing data communication rates, wherein execution of the one or
 6 more sequences of instructions by said processor causes the processor to
 7 perform the steps of:

8 A) assigning said data communication connections to a plurality of buckets that have
 9 a circular order;

10 B) establishing a bucket of said plurality of buckets as a current bucket and
 11 establishing another bucket as a fast bucket;

12 C) establishing a connection assigned to said current bucket as a current connection;

13 D) communicating data over said current connection;

14 E) in response to communicating data over said current connection, re-assigning said
 15 current connection to a different bucket of said plurality of buckets based upon

16 where said current bucket resides in said circular order and a bandwidth
 17 estimation of said current connection;
 18 F) repeating steps (C), (D) and (E) for each connection assigned to said current
 19 bucket;
 20 G) establishing a next bucket as a new current bucket, wherein said next bucket
 21 follows said current bucket in said circular order;
 22 waiting until the earlier of (1) when any connection in the fast bucket is ready for
 23 communication or (2) when a pre-defined period of time elapses; and
 24 H) repeating step (F) and (G) for each bucket of said plurality of buckets.

1 8. The computer system recited in claim 7, wherein the steps further comprise always
 2 placing each newly established connection in the fast bucket until a pre-determined
 3 number of bytes have been communicated on the newly established connection.

1 9. The computer system recited in claim 7, wherein the steps further comprise:
 2 measuring time elapsed in processing connections in a bucket; and
 3 reducing a rate of establishing the connections when the measured time increases.